

WHAT IS CLAIMED IS:

1. A linking apparatus which is connected to first and second networks of different types of communication lines, and performs a packet relay between said first and second networks, comprising:

a first port connected to said first network for receiving a first packet from said first network;

a second port connected to said second network for sending a second packet to said second network;

a receiving section connected to said first port, said receiving section including a memory section storing at least one first header with being associated with packet identification information, determining whether said first packet includes the first header, and when the first header is not included, reading out from said memory section a first header, which is stored with being associated with a packet identification information having a same value as for the packet identification information included in said first packet, among the first headers stored in said memory section to output said first packet to which said read-out first header is added; and

a sending section connected to said second port and said receiving section, said sending section receiving said first packet output from said receiving section, converting said first packet to said second packet, and outputting said second packet to said

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second port.

2. The linking apparatus according to claim 1, wherein, when said first packet includes said first header, said receiving section stores the packet identification information, which is included in said first packet, after being associated with said first header, and outputs said first packet.

3. The linking apparatus according to claim 1, wherein

said receiving section determines whether a packet length of said first packet to which said first header is added is greater than a value of a maximum packet length defined for said second network, and when the packet length of said first packet is greater than the value of said maximum packet length, divides said first packet to two or more third packets to output the third packets; and

each of said third packets includes said first header, and a part of data included in said first packet.

4. The linking apparatus according to claim 3, wherein said sending section receives two or more said third packets output from said receiving section, converts said third packets to said second packets, and outputs said second packets to said second port.

5. The linking apparatus according to claim 1, wherein said receiving section identifies sequence information included in said first packet, and

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determines whether said first packet includes said first header.

6. The linking apparatus according to claim 1, wherein

a format of said first packet differs from a format of said second packet;

said first packet has a second header including said packet identification information and address information of said first network; and

said second packet has a third header including address information of said second network.

7. The linking apparatus according to claim 6, wherein said sending section generates said third header, and adds said generated third header to said first packet to convert said first packet to said second packet.

8. The linking apparatus according to claim 6, wherein said receiving section removes said second header from said first packet to outputs said first packet.

9. The linking apparatus according to claim 1, wherein

said first network is a SAN;

said second network is a LAN; and

said first header is an IP header.

10. A linking apparatus which is connected to first and second communication lines of different types, and performs a packet relay between said first

and second communication lines, comprising:

a first port connected to said first communication line for receiving a first packet from said first communication line;

a second port connected to said second communication line for sending a second packet to said second communication line;

a receiving section connected to said first port, said receiving section having a memory section storing at least one first header with being associated with packet identification information, determining whether said first packet includes the first header, and when the first header is not included, reading out from said memory section a first header, which is stored with being associated with a packet identification information having a same value as for the packet identification information included in said first packet, among the first headers stored in said memory section to output said first packet to which said read-out first header is added; and

a sending section connected to said second port and said receiving section, said sending section receiving said first packet output from said receiving section, converting said first packet to said second packet, and outputting said second packet to said second port.

11. The linking apparatus according to claim 10, wherein, when said first packet includes said first

header, said receiving section stores the packet identification information, which is included in said first packet, after being associated with said first header to output said first packet.

12. The linking apparatus according to claim 10, wherein

said receiving section determines whether a packet length of said first packet to which said first header is added is greater than a value of a maximum packet length defined for said second communication line, and when the packet length of said first packet is greater than the value of the maximum packet length, divides said first packet to two or more third packets to output said third packets; and

each of said third packets includes said first header, and a part of data included in said first packet.

13. The linking apparatus according to claim 12, wherein said sending section receives two or more said third packets output from said receiving section, converts said third packets to said second packets, and outputs said second packets to said second port.

14. The linking apparatus according to claim 10, wherein said receiving section identifies sequence information included in said first packet, and determines whether said first packet includes said first header.

15. The linking apparatus according to claim 10,

wherein

a format of said first packet differs from a format of said second packet;

said first packet has a second header including said packet identification information, and address information of said first communication line; and

said second packet has a third header including address information of said second communication line.

16. The linking apparatus according to claim 15, wherein said sending section generates said third header, and adds said generated third header to said first packet to convert said first packet to said second packet.

17. The linking apparatus according to claim 15, wherein said receiving section removes said second header from said first packet to output said first packet.

18. The linking apparatus according to claim 15, wherein

said first communication line is a Fibre Channel line;

said second communication line is an Ethernet line;

said first header is an IP header;

said second header is an FC header; and

said third header is an Ethernet header.

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19. A linking apparatus which is connected to a SAN and a LAN, and relays a packet, which is sent from a device connected to the SAN, to a device connected to the LAN, comprising:

a first port connected to said SAN for receiving a first packet from said SAN;

a second port connected to said LAN for sending a second packet to said LAN, said second packet having a format different from a format of said first packet; and

a SAN process section connected to said first port for receiving said first packet received at said first port to outputting said first packet,

wherein said SAN process section, comprising:

a memory section;

an identification section for identifying whether said first packet includes an IP header;

a storing section for storing, when said first packet includes the IP header, in said memory section packet identification information, which is included in said first packet, after being associated with said IP header;

a header adding section for reading out, when said first packet does not include said IP header, from said memory section said IP header, which is stored with being associated with packet identification information having a same value as for the packet identification information included in said first

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packet, among said IP headers stored in said memory section to add said IP header to said first packet; and  
a LAN process section connected to said second port and said SAN process section, said LAN process section receiving said first packet output from said SAN process section, including a conversion section for converting said first packet to said second packet, and outputting said second packet to said second port.

20. The linking apparatus according to claim 19, wherein

said SAN process section further comprises a dividing section for determining whether a packet length of said first packet to which said first header is added is greater than a value of a maximum packet length defined for said second network, and for dividing, when the packet length of said first packet is greater than the value of said maximum packet length, said first packet to two or more third packets to output said third packets; and

said conversion section of said LAN process section receives two or more said third packets output from said SAN process section, and converts said third packets to said second packets.